

1. A city has a population of 6,688 people. The area of the city is approximately 7.267 square miles. How many people per square mile live in the city?

$$\frac{\text{people}}{\text{sq. mile}} = \frac{6688}{7.267} = 920 \text{ people per square mile}$$

2. This is a hand drawing of a mountain.



Explain which geometric shape could be used to estimate the total amount of Earth the mountain is made of.

A cone would be the most logical shape to use.

3. A construction company is preparing 10 acres of land for a new housing community. The land contains large rocks that need to be removed. A machine removes 10 rocks from 360 square feet of land.

**1 acre = 43,560 square feet**

About how many rocks will need to be removed from the 10 acres of land?

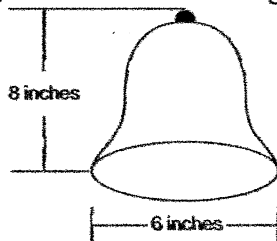
$$10 (43,560) = 435,600 \text{ sq. ft. in 10 acres}$$

$$435,600 \div 360 = 1,210 \text{ parcels of 360 sq. ft.}$$

$$1,210 (10) = 12,100$$

12,100 rocks on 10 acres of land

4. A company needs to package this bell in a rectangular box.



What are the smallest dimensions (length, width, and height) the rectangular box can have so that the lid of the box can also close?

$$6 \text{ in.} \times 6 \text{ in.} \times 8 \text{ in.}$$

5. Joe counts 250 peach trees on 25% of the land he owns. He determined that there are 10 trees for every 1,000 square feet of land. About how many acres of land does Joe own?

**1 acre = 43,560 square feet**

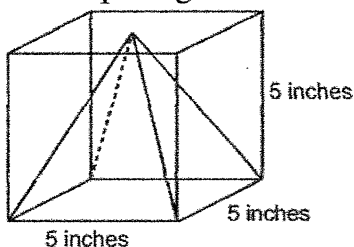
A. 2.3 acres

B. 10 acres

C. 43.56 acres

D. 2,500 acres

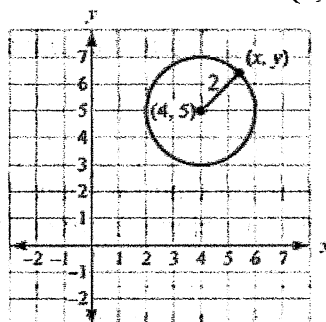
6. A square pyramid is packaged inside a box.



The space inside the box around the pyramid is then filled with protective foam. About how many cubic inches of foam is needed to fill the space around the pyramid?

- A. 8 cubic inches    B. 41 cubic inches    **C. 83 cubic inches**    D. 125 cubic inches

7. What is the equation of the circle with a center at (4, 5) and a radius of 2?



$$(x-4)^2 + (y-5)^2 = 4$$

or

$$x^2 + y^2 - 8x - 10y + 37 = 0$$

8. What is the center and radius of the circle given by  $8x^2 + 8y^2 - 16x - 32y + 24 = 0$ ?

divide by 8     $x^2 + y^2 - 2x - 4y + 3 = 0$

complete the square     $(x^2 - 2x) + (y^2 - 4y) = -3$

$$(x^2 - 2x + 1) + (y^2 - 4y + 4) = -3 + 1 + 4$$

$$(x-1)^2 + (y-2)^2 = 2$$

9. Which is an equation for the circle with a center at (-2, 3) and a radius of 3?

- A.  $x^2 + y^2 + 4x - 6y + 22 = 0$   
 B.  $2x^2 + 2y^2 + 3x - 3y + 4 = 0$   
**C.  $x^2 + y^2 + 4x - 6y + 4 = 0$**   
 D.  $3x^2 + 3y^2 + 4x - 6y + 4 = 0$

10. What is the center of the circle given by the equation  $x^2 + y^2 - 10x - 11 = 0$ ?

- A. (5, 0)**    B. (0, 5)    C. (-5, 0)    D. (0, -5)